

Villarreal, Monique

From: Joseph, Paul
Sent: Tuesday, June 26, 2018 2:46 PM
To: Villarreal, Monique
Subject: Fw: Facial Recognition Technology
Attachments: Camvi-AI-Biometrics-Overview.pdf

From: Matt McCrann <matt.mccrann@camvitech.com>
Sent: Thursday, February 22, 2018 1:32 PM
To: Joseph, Paul
Cc: john.chen@camvitech.com
Subject: Re: Facial Recognition Technology

Hi Paul,

Thanks for taking the time to discuss some of your unit's requirements today. I think your use cases are a great match for Camvi's capabilities and I look forward to supporting your team any way we can.

I've attached more information on our solutions for you to share internally. If you or anyone at San Jose PD have questions regarding our capabilities, please feel free to reach out at anytime.

Also, I know you have some calls to take care of with other vendors, when do you plan to move forward in your evaluations? We'd love the opportunity to have SJPD see what it can do with Camvi's technology.

Thanks again Paul!

Best regards,

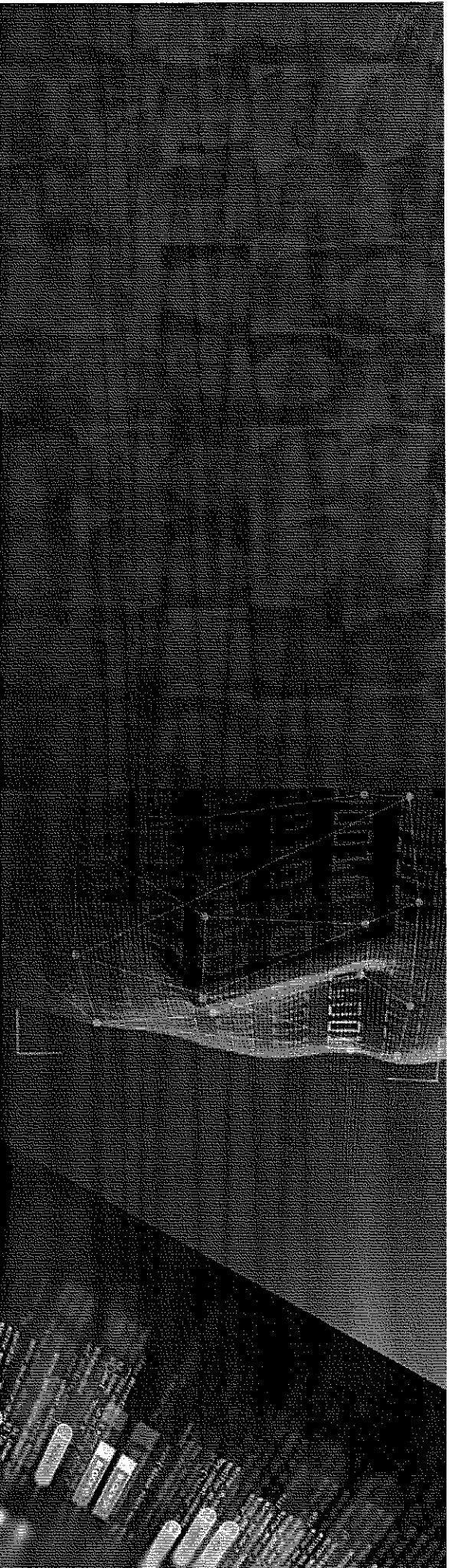
Matt McCrann
Director, Sales & Business Development
Camvi Technologies
+1 202.468.8467
matt.mccrann@camvitech.com
www.camvitech.com

On Thu, Feb 22, 2018 at 2:20 PM Joseph, Paul <PAUL.JOSEPH@sanjoseca.gov> wrote:

I am the Lieutenant at the San Jose PD Robbery Unit. Amongst my other duties, I am working on researching the acquisition by SJPD of some form of facial recognition technology. I understand that your company may have a product that could meet our needs.

Please call me at 408-277-4166 so that we may discuss our Department's needs, and your company's products.

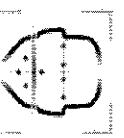
Lt. Paul Joseph #3148
San Jose Police Department
Bureau of Investigations/Robbery



Camvi Technologies

Overview

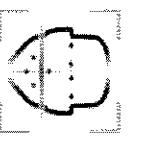
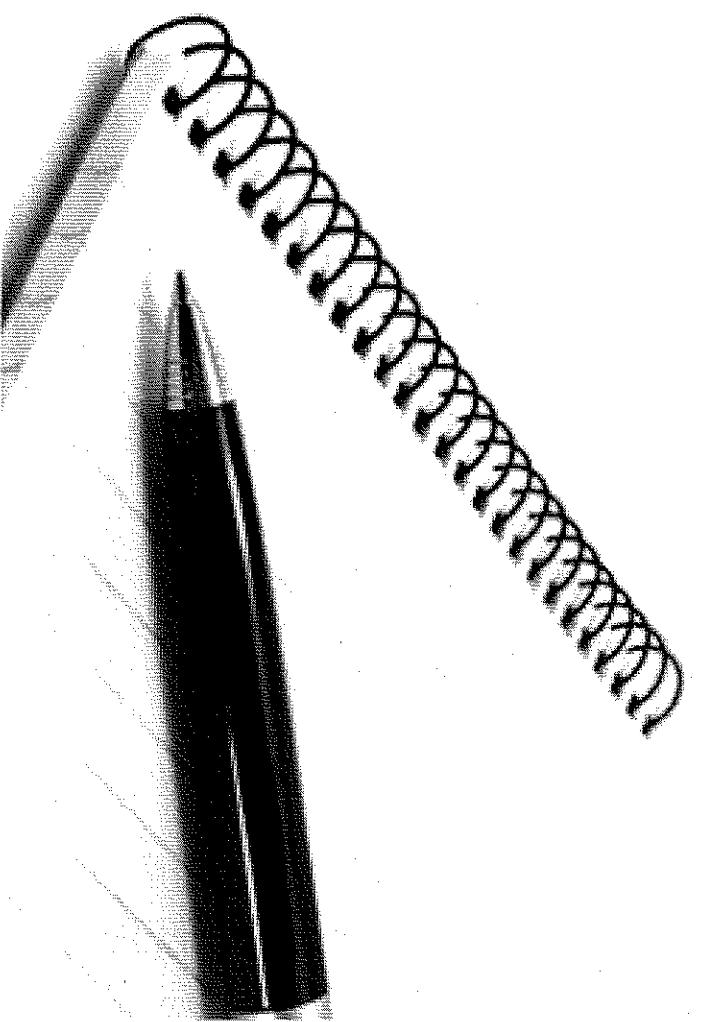
February 2018



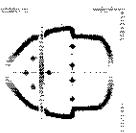
Camvi
Technologies

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- Camvi Background
- Camvi Solutions
- Summary
- Contact

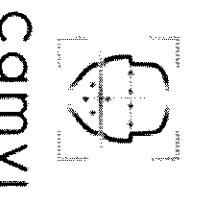


Camvi Technologies

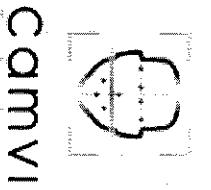


- Founded in 2014
- Headquartered in Palo Alto, CA with offices in Burlington, MA and Germantown, MD.
- Leader in AI & Machine Learning Biometrics
- Validated Solutions - independent testing by several government agencies worldwide (e.g. NIST)
- Serves Government and Enterprise Customers

Multi-Modal Biometrics: Markets



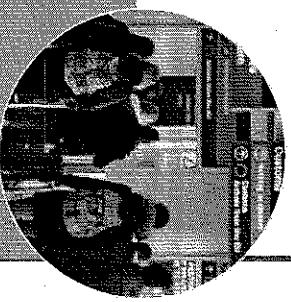
Current Customer Base and Products



Government

- Real-time identification of illegals in ASEAN
- Hand-held device with integrated fingerprint and facial recognition
- Roll-out of Edge Solutions in multiple countries

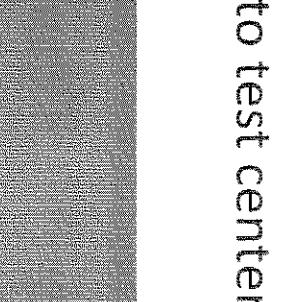
Border Control



Cross-Sector

- Security: Perimeter entry/exit via face & vehicle matching
- Intelligent Access: manage access to secure rooms & buildings
- Commercial: enforce access rules across multi-zone campus
- Education: student access to test center

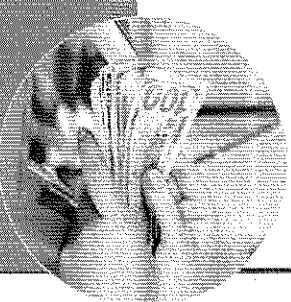
Access Control



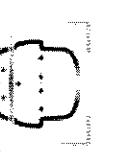
Enterprise

- Banking customer registration with biometrics
- Banking customer identification via facial recognition, voice recognition
- E-Commerce authentication
- Integrated solution in ASEAN

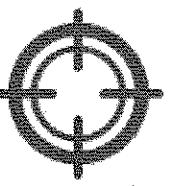
Banking



Competitive Advantages

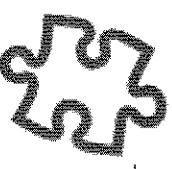


Camvi
Pioneering AI



Accuracy Combined With Speed

- Sub 200 millisecond search and retrieval time on a single commodity server node with a database containing 5 million faces
- LFW benchmark face verification accuracy 99.6%



Scalable Cloud and Edge Solution

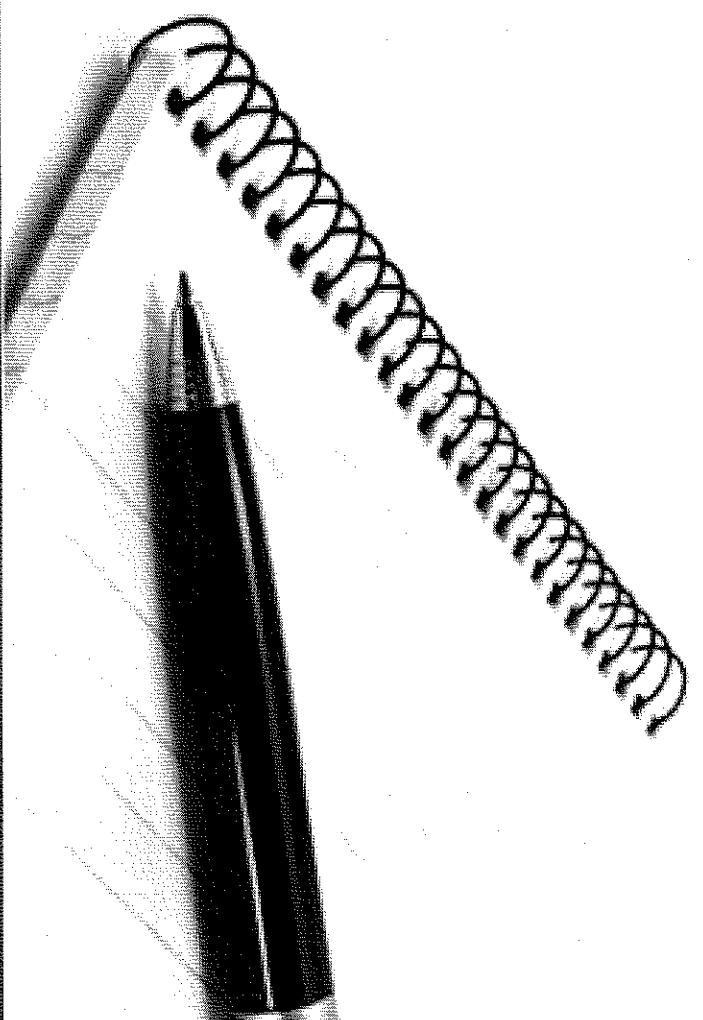
- Massively scalable architecture capable of supporting **billions of face records** (Solid deployment track record: nationwide deployed)
- Low-power, high-performance **edge platforms** for deep learning-based inference and/or training to achieve superior performance

Value

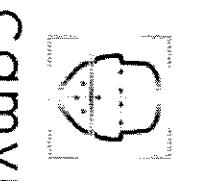
- AI-powered architecture supports complex and challenging use cases
- Scalable pricing based on size of face database and transaction usage
- Significantly higher value unlocked by a Camvi deployment compared to 1st Gen alternatives

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Camvi Products and Services



Camvi Biometric Solutions

Server Solutions

CamviServer

Cloud-based biometric server

Edge Solutions

CamviEdge

Edge biometric solution with ports for attaching pre-AI customer devices

Client Solutions

CamviClient

Client-side biometric App (Android-based)

Services

CamviDTS

Data Training Service

Services

CamviCare

Installation, maintenance and support services

CamviCloud

Cloud hosting service for CamviServer

CamviAdapter

AI-powered adapters for pre-AI customer devices

CamviCam

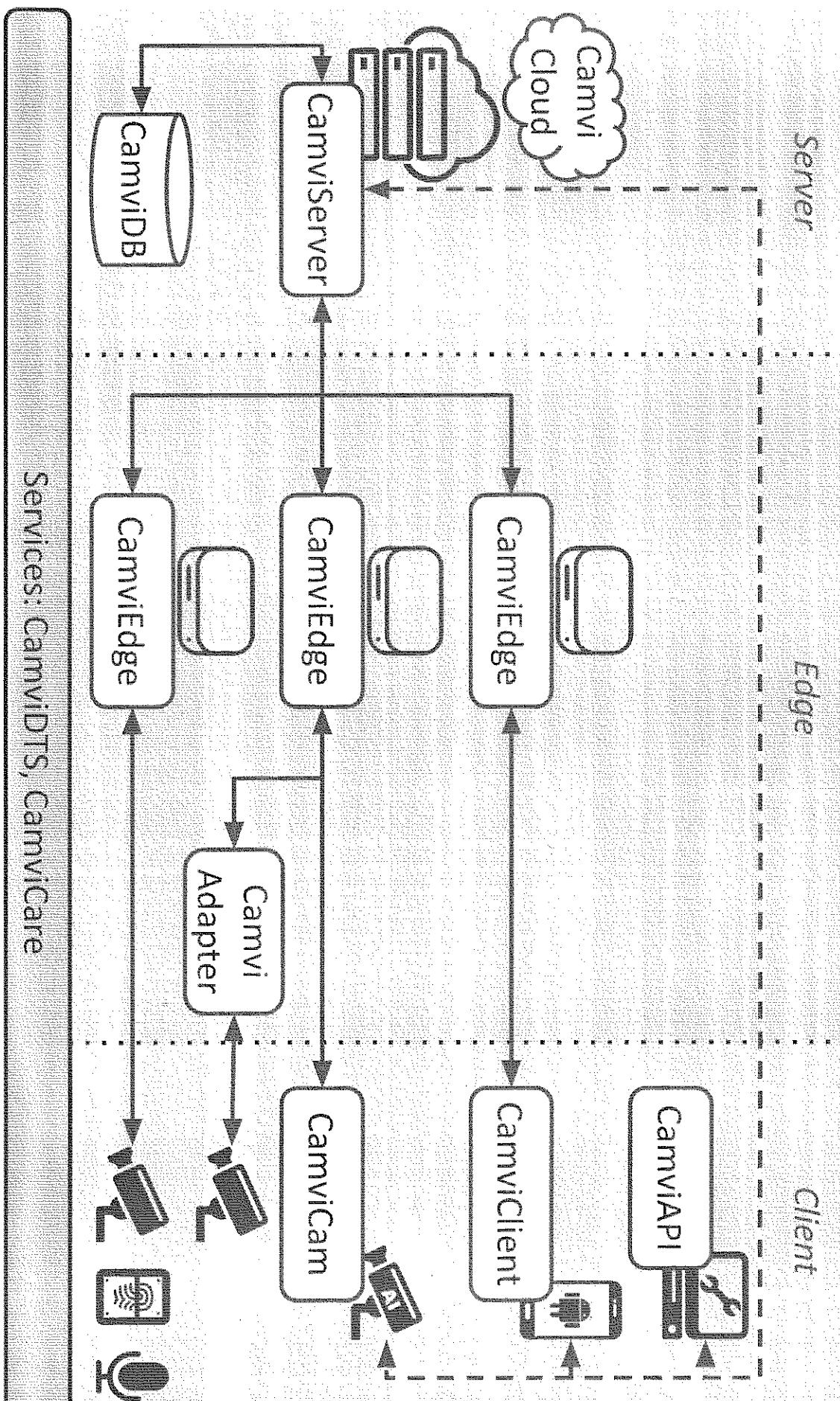
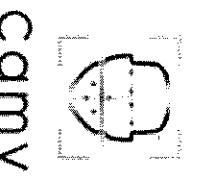
AI-powered cameras

CamviAPI

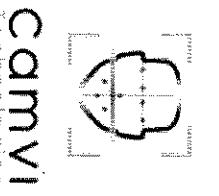
CamviEdge system with Visual Processing Unit (VPU) in custom silicon

* Roadmap - 2019

Camvi Solutions Architecture



CamViServer: Cloud-Based Biometric Server



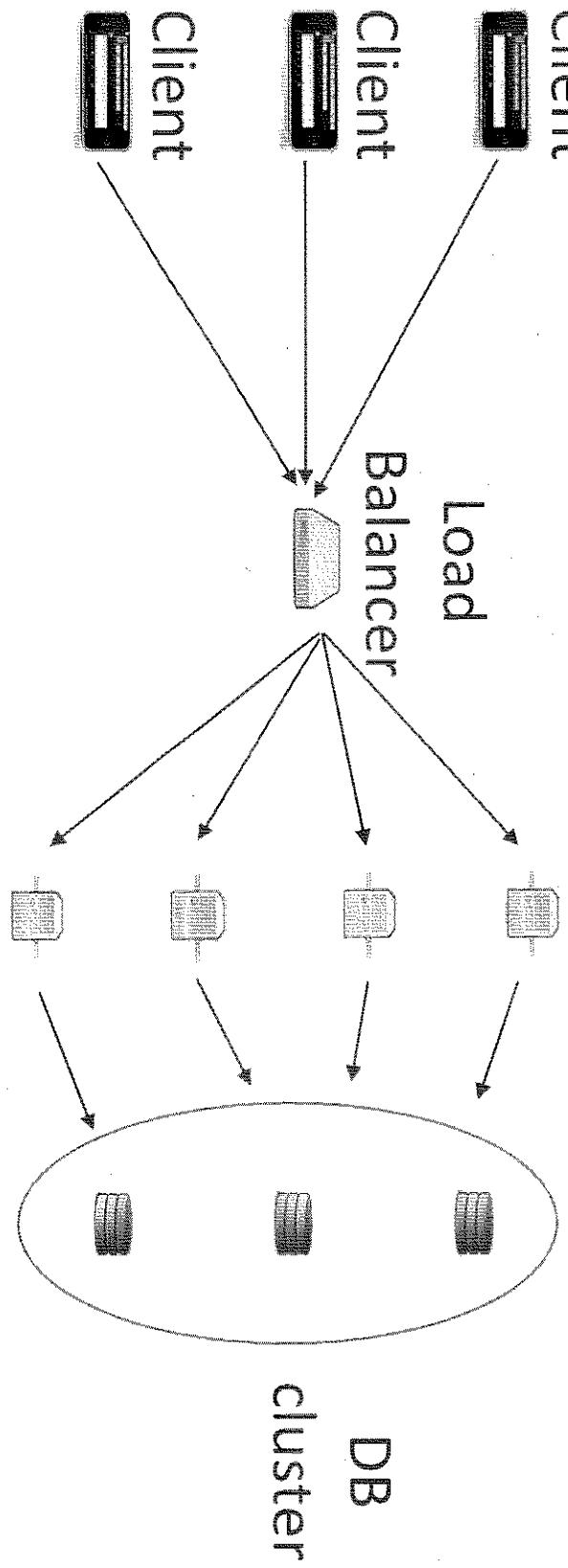
- Commercially Available Today

- Deep learning-based recognition module
- Efficient feature representation of facial data
- Reliable architecture scales to > 1 billion subjects

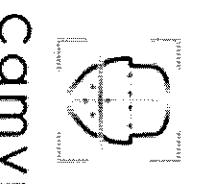
Applications:
Large-scale access
control, borders, secure
campus, airports

CamViServer

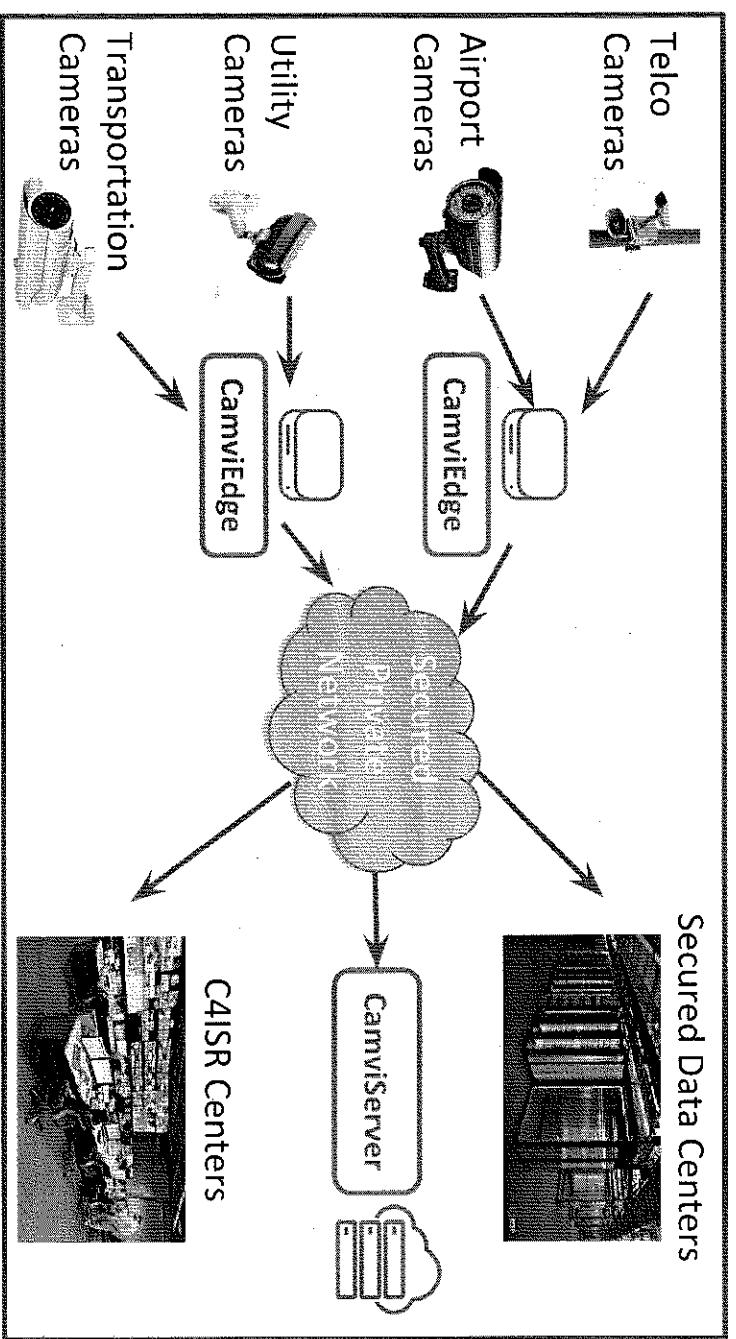
Recognition Servers



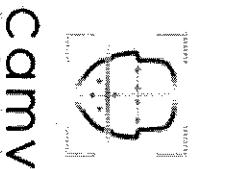
CamviEdge: Edge Biometric Solution



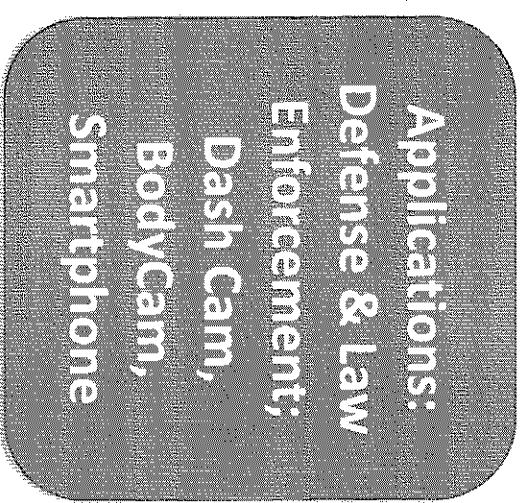
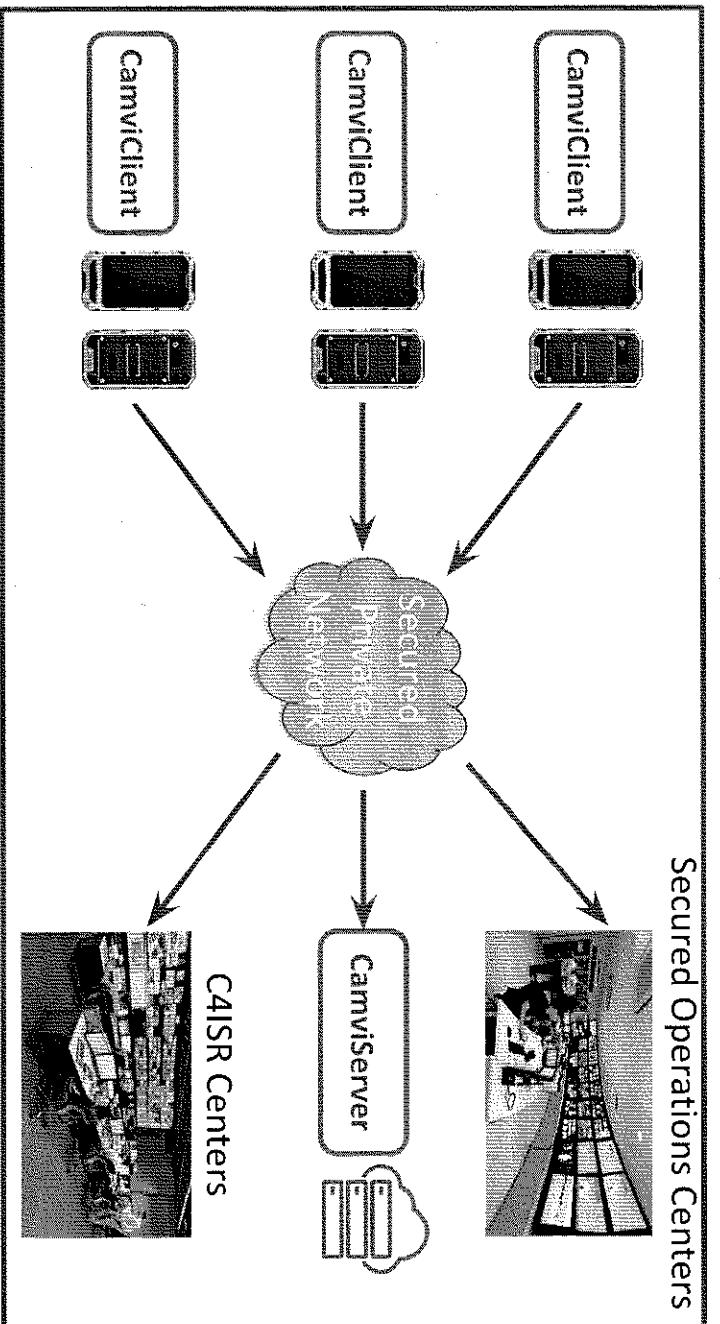
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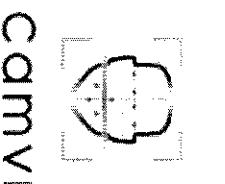
CamviClient: Client-Side Biometric App



- CamviClient provides users with an Android-based client application for biometrics
- Delivers high performance biometrics to a wide range of Android client devices
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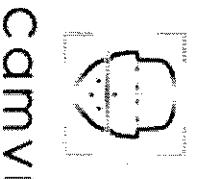
CamviAdapter: AI-Powered Adapters



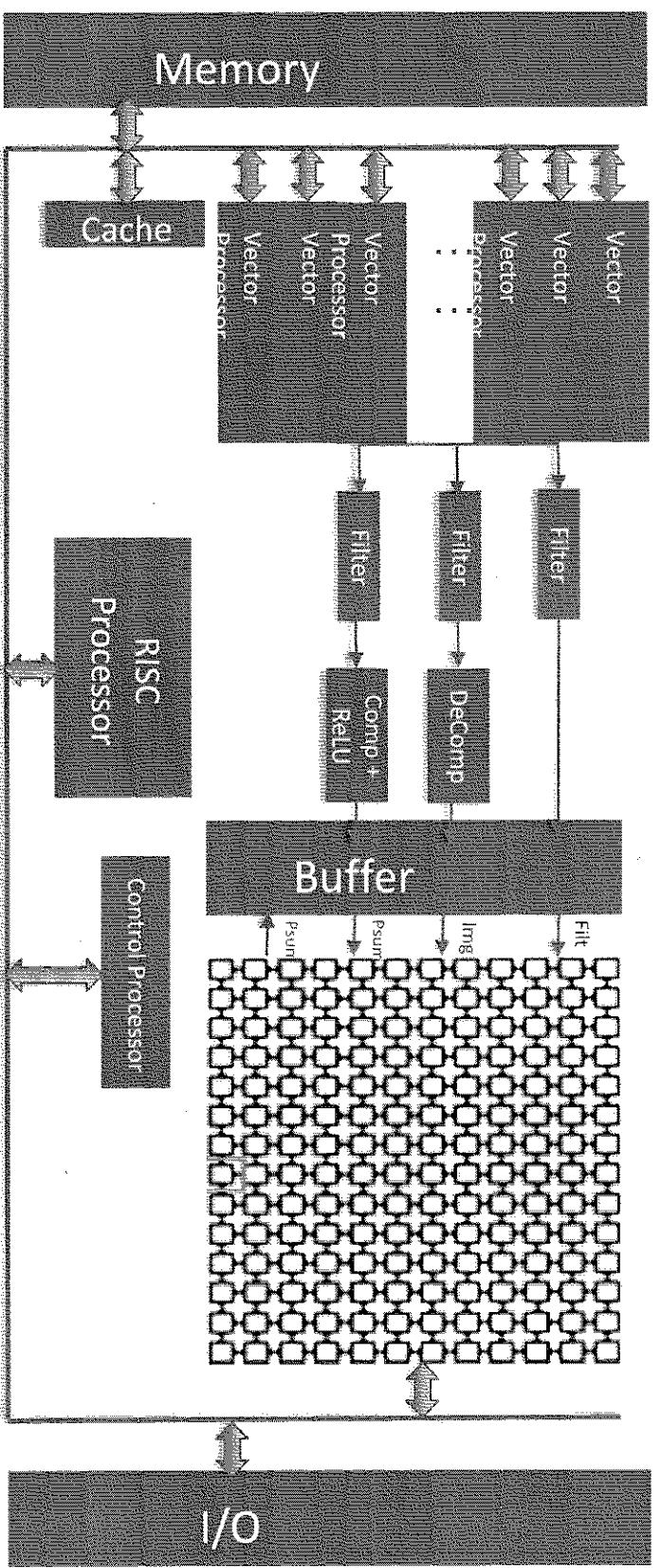
- A range of AI-powered adapters to retrofit to existing cameras
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 - Facilitates streamlined machine-driven decisions
- Extends lifetime of existing cameras by 5+ years
 - Flexible implementation provides path for future upgrades
- Protects capital and operational investments in installed bases

Application: Legacy CCTV Surveillance & Access Control

CamviEdge-VPU (2019)

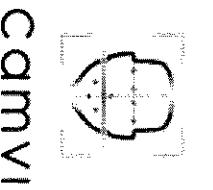


- Ultra low-power & high-performance VPU chip
- AI-Powered Biometrics on a Chip (AIBoC)
- Patent pending



Application: Massive scale machine-based monitoring

CamviDTS: Data Training Service



- CamviDTS is a world-class Data Training Service for customers
- Unlocks continuous improvement in performance and accuracy of biometric matching
- Staffed by Camvi Data Scientists to optimize customers' data sets
- How it Works:
 - Customers optimize their own data training models for Camvi deployments
 - Customers retain control of their own data sets at all times
 - Camvi provides tools and expertise throughout the lifetime of the process

Applicable to all Camvi customers

Multi-modal & Compounded Solutions

Camvi

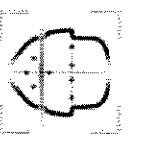
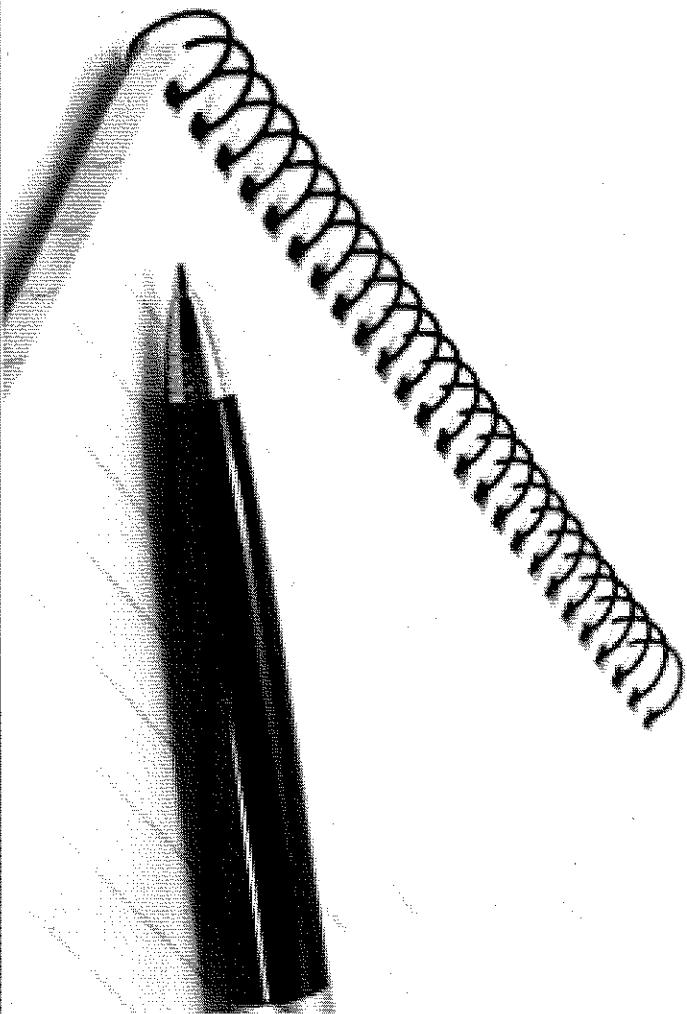
Camvi offers multimodal biometrics and compounded solutions consisting of Biometrics and Object Recognition:

- Mobile Fingerprint + Face
- Advanced License Plate Reader
 - Match face with plate
 - Partial plate matches
 - Multiple faces and plates from video in real-time
 - Pilot underway in Thailand
- **What's Next:** Personalization match by bumper stickers, emblems, stickers, damage detection.

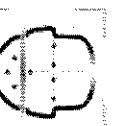
Applications: Border Control and Law Enforcement

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Summary



Camvi

- AI-powered Biometric Solutions
- Lightweight solutions = speed, flexibility; capture, compute, validate on the edge
- Highly cost-effective and scalable; handheld to databases with greater than a *Billion* faces
- Integrates Facial Recognition, Multimodal Biometrics, and Object Recognition

Contact

Camvi Technologies Inc.

228 Hamilton Avenue, 3rd Floor

Palo Alto, CA 94301

Phone: +1 650-798-5443

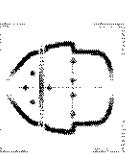
www.camvitech.com

Matt McCrann

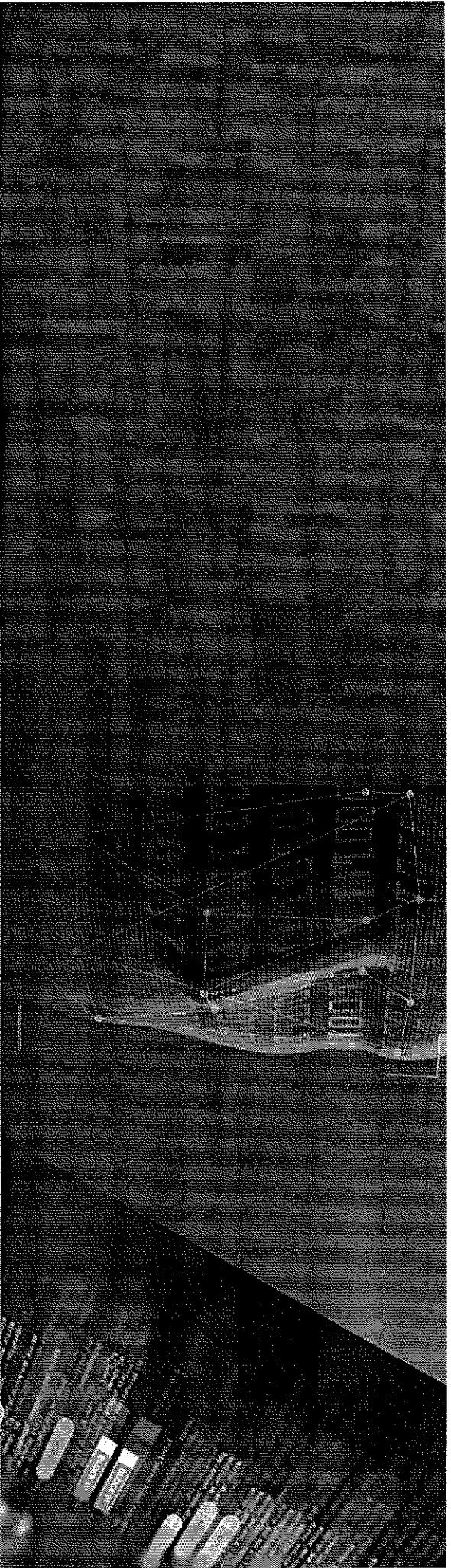
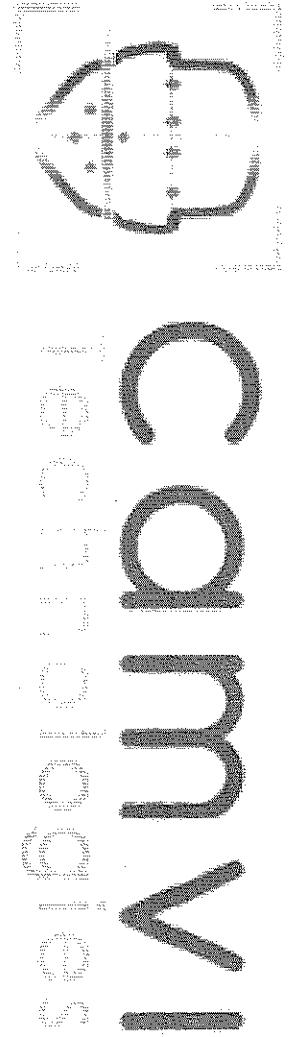
Director, Sales & Business Development

matt.mccrann@camvitech.com

+1 202-468-8467



Thank you!



Villarreal, Monique

From: Joseph, Paul
Sent: Tuesday, June 26, 2018 2:47 PM
To: Villarreal, Monique
Subject: Fw: SYPD - Camvi Technologies
Attachments: Camvi-AI-Biometrics-Overview.pdf

From: Matt McCrann <matt.mccrann@camvitech.com>

Sent: Friday, March 9, 2018 8:44 AM

To: Joseph, Paul

Cc: Williams, Shawny; Schroder, Edward; Tindall, David; Lombardo, Gregory; Spagnoli, Paul; Ta, Jason; Chen, Derek; Storlie, Craig; Pedreira, Eduardo; John Chen

Subject: SYPD - Camvi Technologies

Hi Paul,

I want to thank you and the team for taking the time yesterday to meet with us. I am attaching a soft copy of the presentation we covered for your reference. If any follow-on questions arise, please don't hesitate to contact us at anytime.

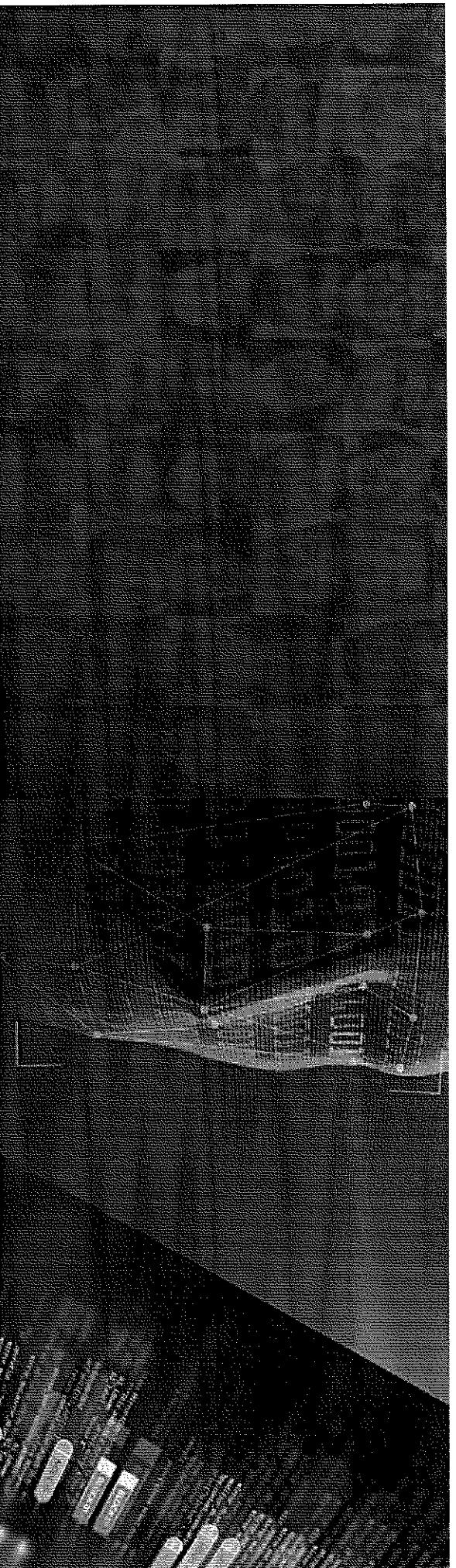
We look forward to demonstrating the specific use cases brought up yesterday i.e. stills from video against actual database, mobile/smartphone application scenarios. We should be good to go in a month, so please let us know what and when works best for the team there anytime in April or May.

Also, we'd love to demonstrate a relevant scenario regarding your actual images, so if you'd like for us to work with your Systems Team, just let us know the best way forward.

Thanks again and have a great weekend!

Best regards,

Matt McCrann
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Camvi Technologies

Overview

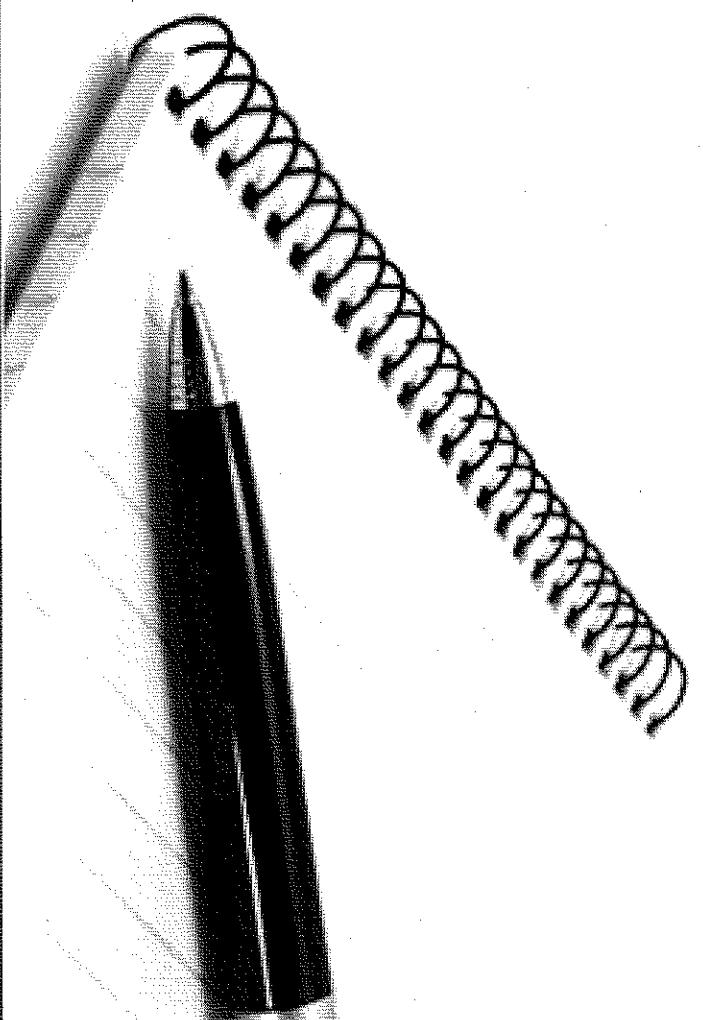
March 2018



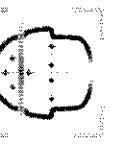
Camvi
Technologies

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Multi-Modal Biometrics: Markets

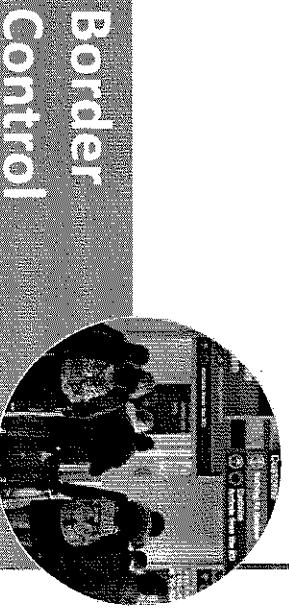


Current Customer Base and Products

CamVi
Biometrics

Government

- Real-time identification of Illegals in ASEAN
- Hand-held device with integrated fingerprint and facial recognition
- Roll-out of Edge Solutions in multiple countries



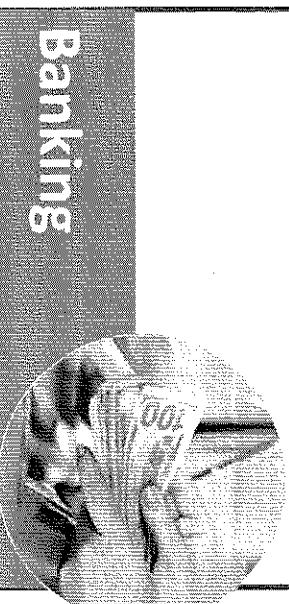
Cross-Sector

- Security: Perimeter entry/exit via face & vehicle matching
- Intelligent Access: manage access to secure rooms & buildings
- Commercial: enforce access rules across multi-zone campus
- Education: student access to test center

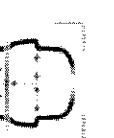


Enterprise

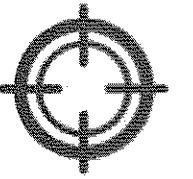
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- Banking customer identification via facial recognition, voice recognition
- E-Commerce authentication
- Integrated solution in ASEAN



Competitive Advantages

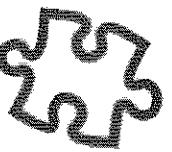


Camvi
Technologies



Accuracy combined with Speed

- Sub 200 millisecond search and retrieval time on a single commodity server node with a database containing 5 million faces
- LFW (faces in the wild) benchmark face verification accuracy 99.6%



Scalable Cloud and Edge Solution

- Massively scalable architecture capable of supporting **billions of face records** (Solid deployment track record: nationwide deployments)
- Low-power, high-performance **edge platforms** for deep learning-based inference and/or training to achieve superior performance

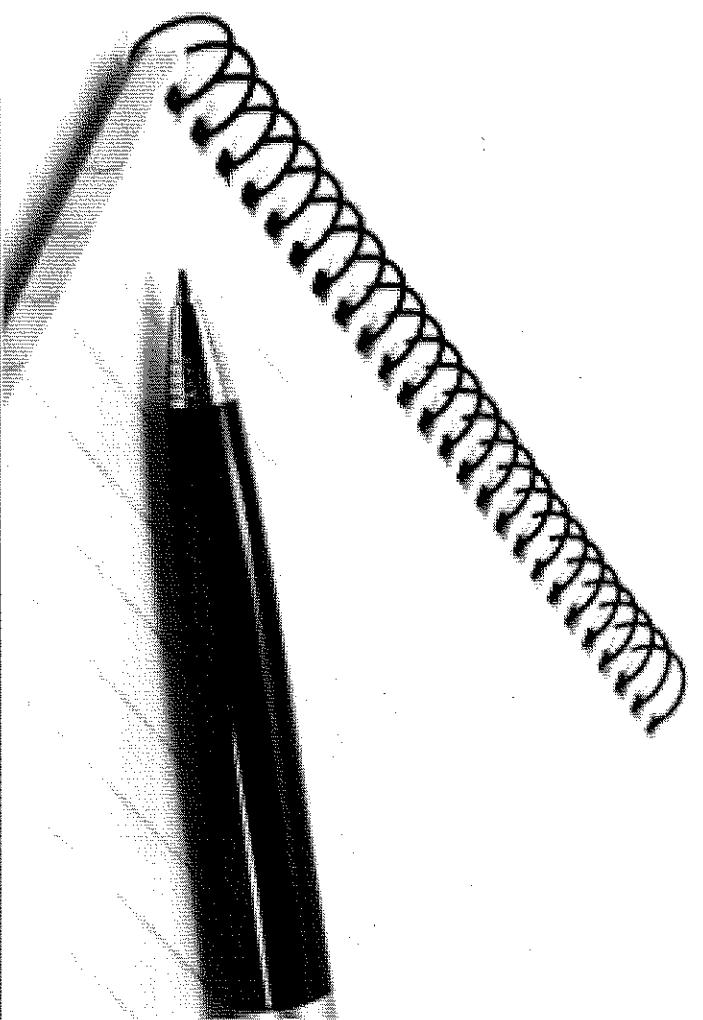
Value



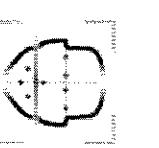
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Services

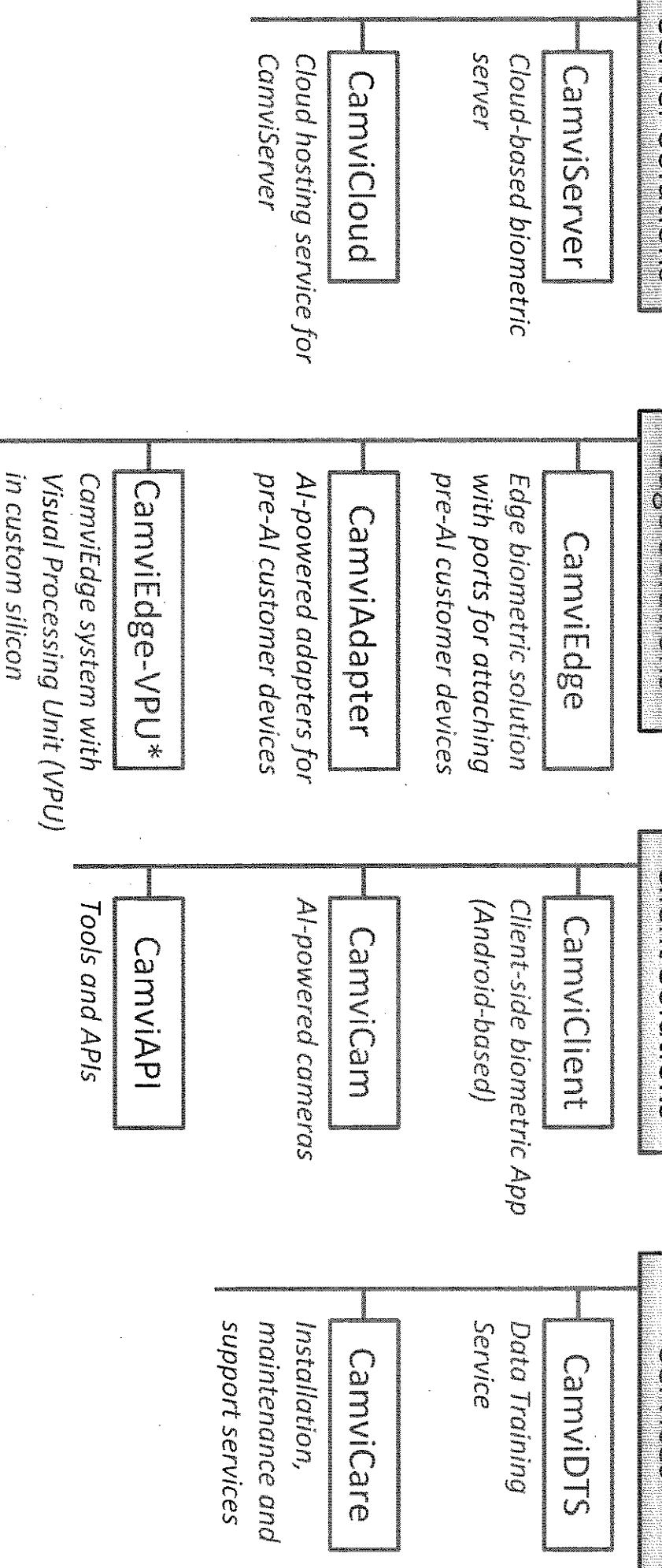
CamviDTS

Data Training Service

Services

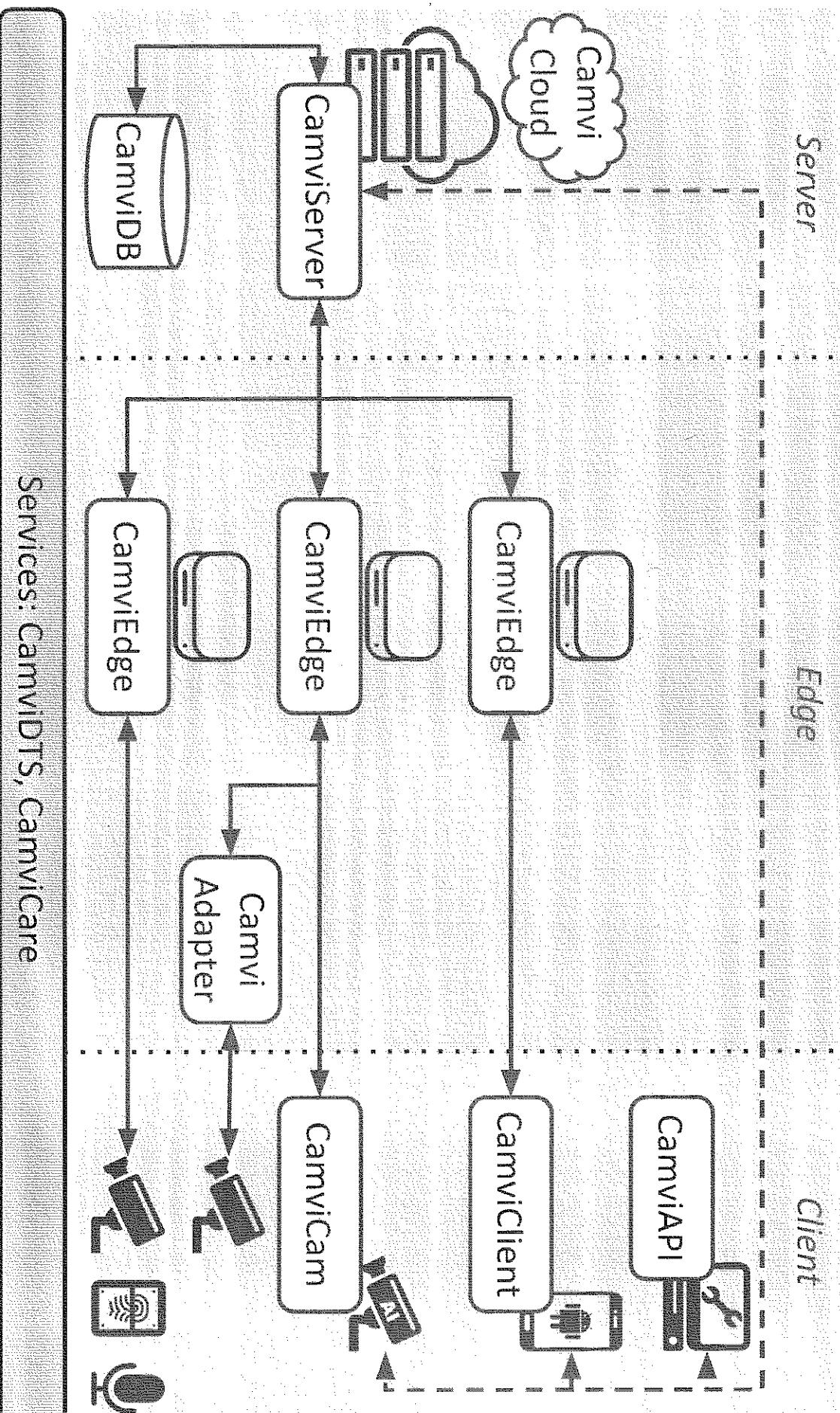
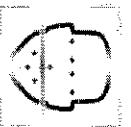
CamviCare

Installation, maintenance and support services



* Roadmap - 2019

Camvi Solutions Architecture



CamviServer: Cloud-Based Biometric Server

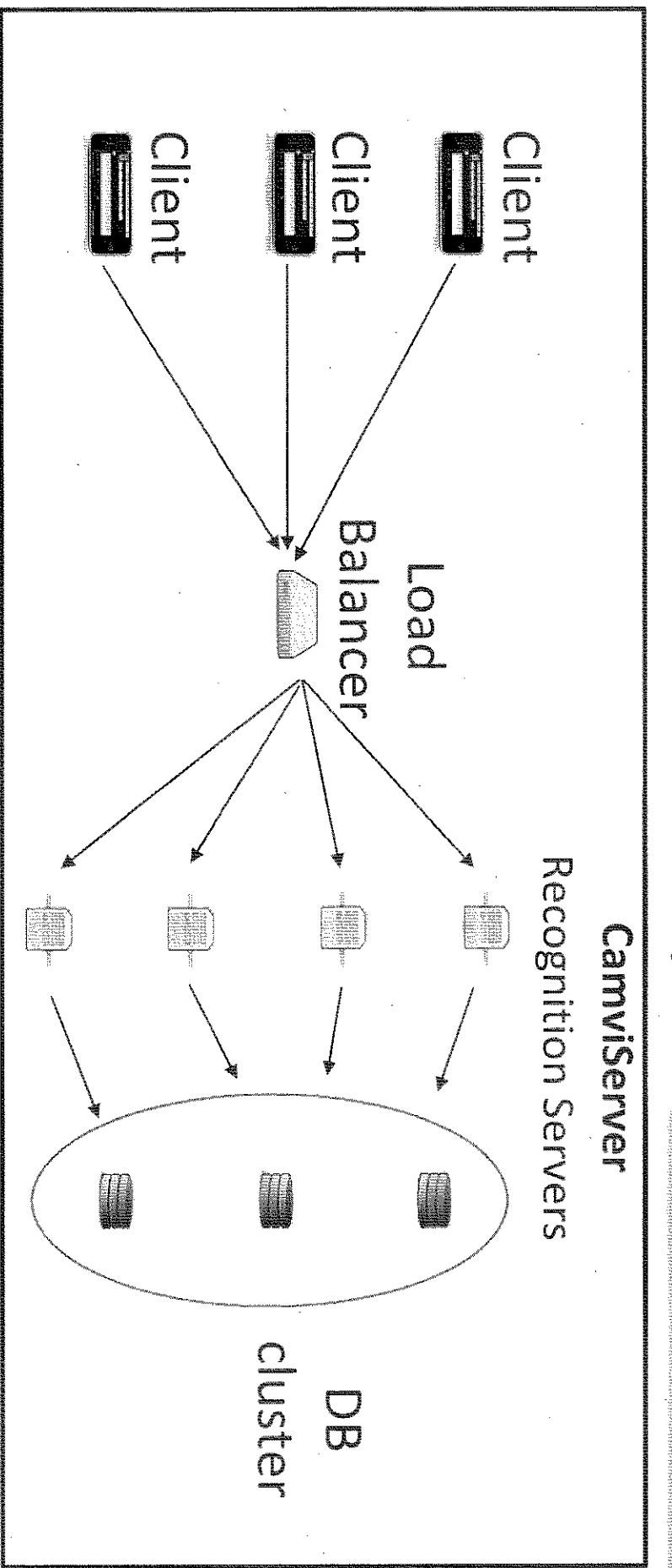
Camvi

- Commercially Available Today

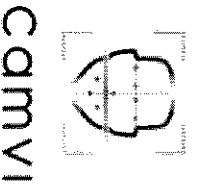
- Deep learning-based recognition module
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Applications:

Large-scale access
control, borders, secure
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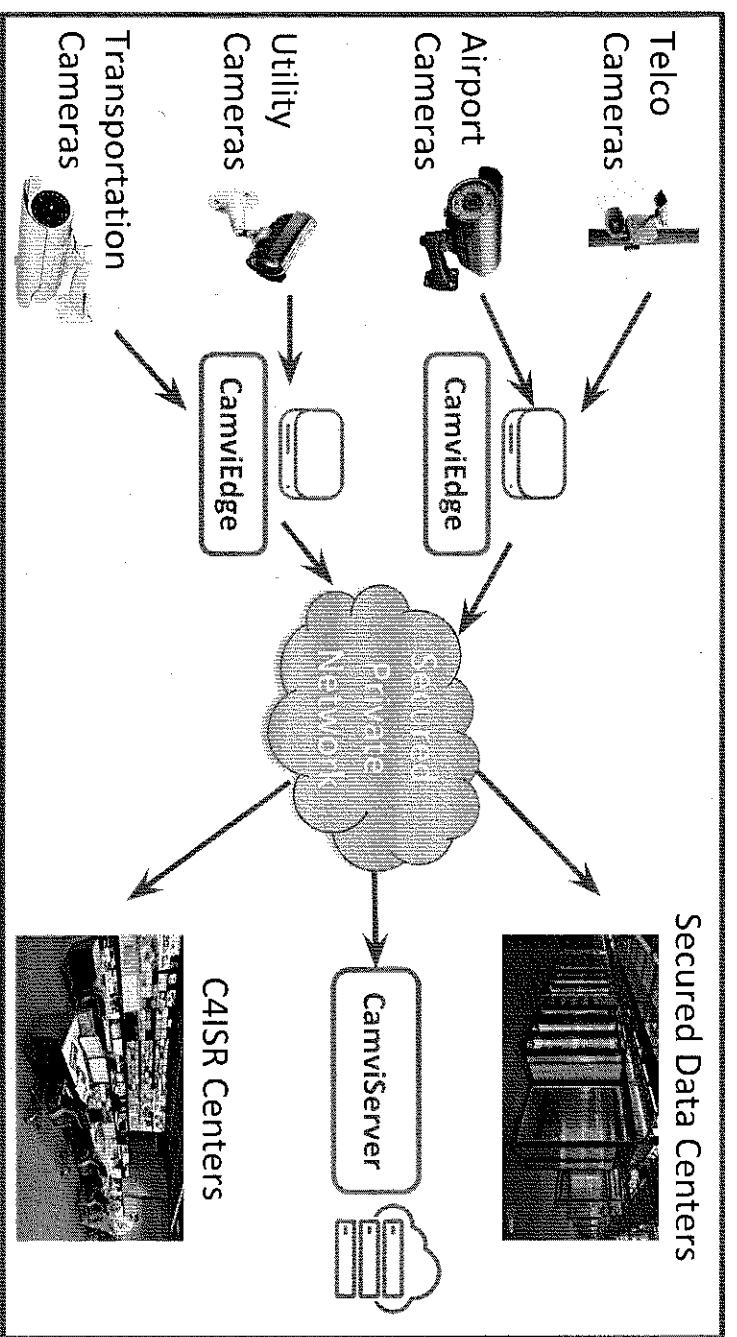


CamviEdge: Edge Biometric Solution

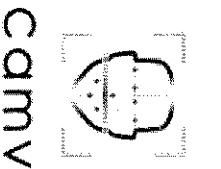


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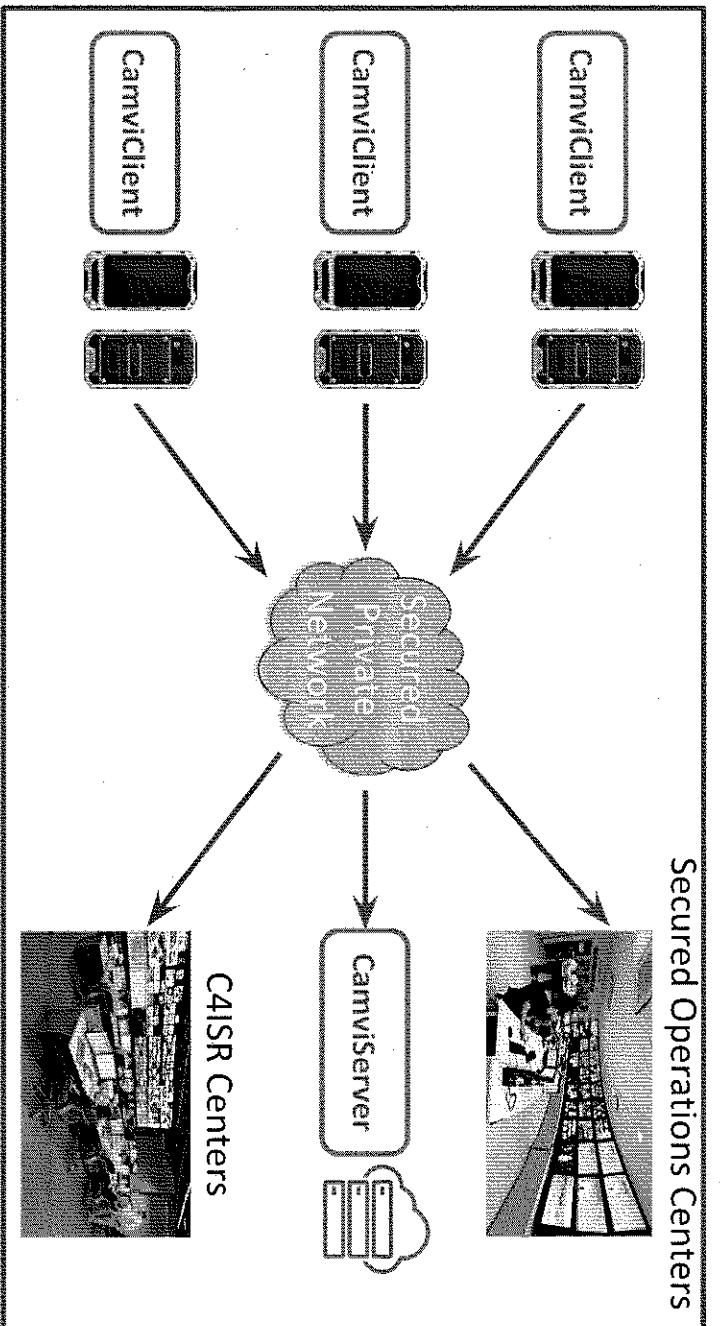
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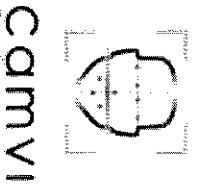
CamviAdapter: AI-Powered Adapters

Camvi
Technologies
Solutions

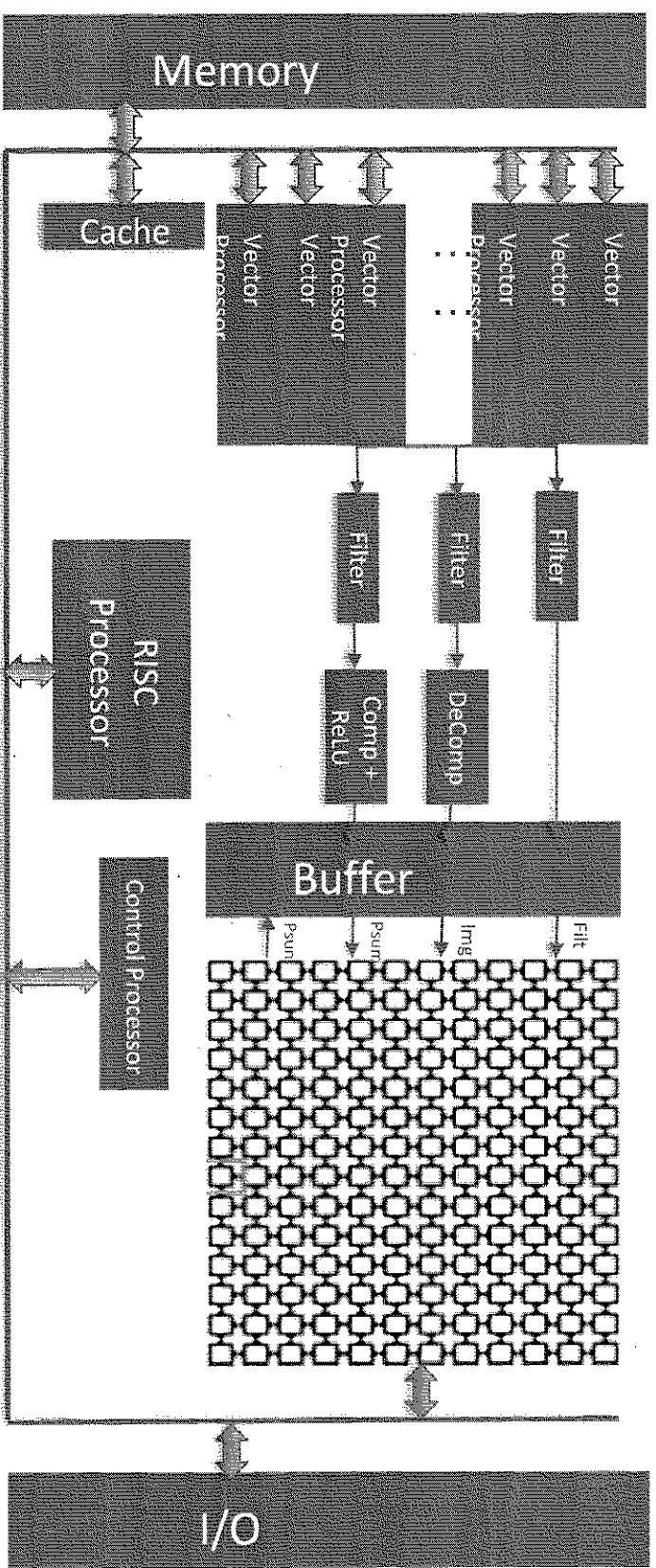
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CamviEdge-VPU (2019)

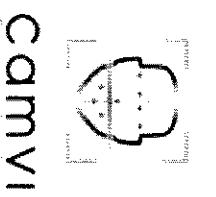


- Ultra low-power & high-performance VPU chip
- AI-Powered Biometrics on a Chip (AIBoC)
- Patent pending



Application: Massive scale machine-based monitoring

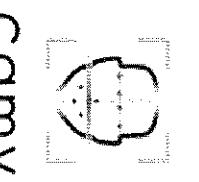
CamviDTS: Data Training Service



- CamviDTS is a world-class **Data Training Service** for customers
- Unlocks continuous improvement in performance and accuracy of biometric matching
- Staffed by Camvi Data Scientists to optimize customers' data sets
- How it Works:
 - Customers optimize their own data training models for Camvi deployments
 - Customers retain control of their own data sets at all times
 - Camvi provides tools and expertise throughout the lifetime of the process

Applicable to all Camvi customers

Multi-modal & Compounded Solutions



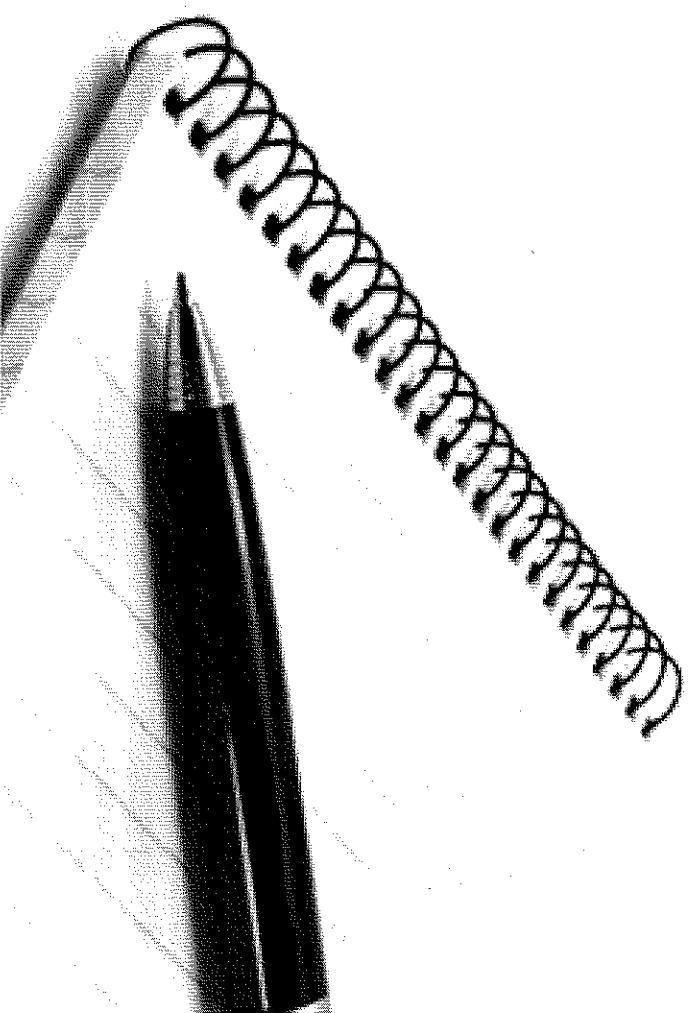
Camvi offers multimodal biometrics and compounded solutions consisting of Biometrics and Object Recognition:

- Mobile Fingerprint + Face
- Advanced License Plate Reader
 - Match face with plate
 - Partial plate matches
 - Multiple faces and plates from video in real-time
 - Pilot underway in Thailand
- *What's Next:* Personalization match by bumper stickers, emblems, stickers, damage detection.

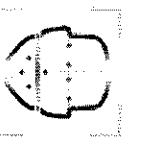
Applications: Border Control and Law Enforcement

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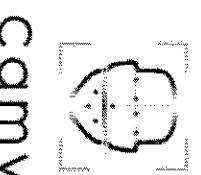
Summary



Camvi
THE CHIPS
COMPANY

- AI-powered Biometric Solutions
- Lightweight solutions = speed, flexibility; capture, compute, validate on the edge
- Highly cost-effective and scalable; handheld to databases with greater than a *Billion* faces
- Integrates Facial Recognition, Multimodal Biometrics, and Object Recognition

Contact



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Thank you!

